

NINE NEW SPECIES OF GEOSCAPHEINAE (BLATTODEA: BLABERIDAE) FROM AUSTRALIA

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Nine new species of soil burrowing Geoscapheinae cockroaches are described from Queensland: *Geoscapheus rugulosus*, *G. woodwardi*, *Macropanesthia heppleorum*, *M. kinkuna*, *M. lithgawae*, *M. rothi*, *M. saxicola*, *Neogeoscapheus barbarae*, and *Parapanesthia pearsoni*. Keys to the genera and species of Geoscapheinae are provided. The male of *M. monteithi* Roth and the male genitalia of *M. kraussiana* (Saussure) are described.

□ Blattodea, Geoscapheinae, new species, taxonomy, keys, Australia.

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The Geoscapheinae contains soil burrowing species which feed on dry leaf litter. Biology of a representative, *Macropanesthia rhinoceros* Saussure, was described by Rugg & Rose (1991). *Geoscapheus* Tepper, *Macropanesthia* Saussure, *Neogeoscapheus* Roth and *Parapanesthia* Roth are endemic to Australia. Roth (1977) placed the 4 genera in the Panesthiinae. Rugg & Rose (1984) reinstated the Geoscapheinae with these 4 genera on differences in reproductive biology, morphology and ecology.

We describe 9 new species of Geoscapheinae from various areas of Queensland (Fig.1). Roth (1977) described *M. monteithi* Roth from female specimens only and *M. kraussiana* (Saussure) from a damaged male lacking genitalia. He described all other Geoscapheinae and Australian Panesthiinae from males. McKittrick (1964) showed that male genitalia are important specific features in cockroaches so we describe the male of *M. monteithi* and the male genitalia of *M. kraussiana*.

Measurements are in millimetres unless stated. Scale bars represent 2mm unless stated. In descriptions of males, measurements of the holotype are given and those of the paratypes are in brackets. Measurements of females refer to the paratypes. Terminology used for the male genital phallomeres is that of McKittrick (1964) and Roth (1977). Keys are for adults only but can often be applied to nymphs.

ABBREVIATIONS USED

COLLECTORS: BRR, B.R. Rose; HAR, H.A. Rose; DR, D. Rugg; JAW, J.A. Walker; JRW, J.R. Woodward.

MUSEUMS: ANIC, Australian National Insect Collection, CSIRO, Canberra; MMUS, Macleay Museum, The University of Sydney, Sydney; QM, Queensland Museum, Brisbane; UQIC, University of Queensland Insect Collection, Brisbane; SAM, South Australian Museum, Adelaide; USIC, The University of Sydney Insect Collection (Department of Crop Sciences), Sydney.

SYSTEMATICS

Family BLABERIDAE Subfamily PANESTHIINAE

Wings and tegmina present (though may be vestigial or reduced through mutilation); if wings and tegmina totally absent then laterocaudal angle of tergite 6 is not produced into a spine.

Subfamily GEOSCAPHEINAE

Wings and tegmina totally absent and laterocaudal angle of tergite 7 produced and directed laterally or dorsally; if directed ventrocaudally or obliquely posteriorly then laterocaudal angle of tergite 6 produced into a short spine.

KEY TO GENERA OF GEOSCAPHEINAE

1. Posterior margin of tergite 6 without spines or tubercles (exclusive of the laterocaudal angle), but may be thickened and weakly undulate, or with a raised ridge 2
- Posterior margin of tergite 6 with one or

- more raised spines or tubercles, exclusive of the laterocaudal angle 3
2. Laterocaudal angle of tergites 6 and 7 produced into large spines, that on 6 curved dorsad, that on 7 directed obliquely upwards *Geoscapheus*
- Laterocaudal angle of 6 not produced or if produced then not curved dorsad, that on 7 directed slightly or strongly dorsad, or ventrocaudally or obliquely and posteriorly *Macropanesthia*
3. Posterior margin of tergite 6 with a single large, upturned acute spine, or a broadly rounded tubercle lateral to a small or non-produced caudal angle *Neogeoscapheus*
- Posterior margin of tergite 6 with several erect rounded tubercles laterally *Parapanesthia*

KEY TO SPECIES OF *GEOSCAPHEUS*

1. Hind margin of supraanal plate crenulate *G. crenulatus* (Shaw)
- Hind margin of supraanal plate smooth 2
2. Thoracic nota cream to castaneous laterally, pronotum black anteromedially *G. woodwardi* sp. nov.
- Thoracic nota black or ferrugineous 3
3. Dorsal surface matt; anterior pronotal margin with a single tubercle (♂) *G. rugulosus* sp. nov.
- Dorsal surface shiny; anterior pronotal margin without, or with two, tubercles (♂) 4
4. Abdominal tergites sparsely punctate, mostly laterally; lateral angles of supraanal plate rounded, shallow, but usually distinct; hind margin of last sternite deeply concave (♂) *G. robustus* (Tepper)
- Abdominal tergites usually densely punctate, lateral punctations larger; lateral angles of supraanal plate hardly produced; hind margin of last sternite shallowly concave (♂) *G. dilatatus* (Saussure)

KEY TO SPECIES OF *NEOGEOSCAPHEUS*

1. Hind margin of tergite 6 with a large spine separate from the laterocaudal angle 2
- Hind margin of tergite 6 with a rounded tubercle separate from the laterocaudal angle *N. hirsutus* (Shaw)
2. Laterocaudal angle of tergite 6 produced into a small spine, directed posteriorly; tergites finely punctate medially *N. dahmsi* Roth
- Laterocaudal angle of tergite 6 not produced

- into a spine; tergites smooth to sparsely and weakly punctate medially *N. barbarae* sp. nov.

KEY TO SPECIES OF *PARAPANESTHIA*

- Laterocaudal angle of tergite 6 produced into a small spine; posterior margin of tergite 5 without tubercles *P. pearsoni* sp. nov.
- Laterocaudal angle of tergite 6 not produced into a spine; posterior margin of tergite 5 often with several tubercles laterally *P. gigantea* (Tepper)

KEY TO SPECIES OF *MACROPANESTHIA*

1. Thoracic nota with a cream to orange border laterally *M. kraussiana* (Saussure)
- Thoracic nota ferrugineous, brown or black, laterally 2
2. Cerci bulbous, apex broadly rounded, densely setose dorsally and ventrally 3
- Cerci tapered, apex acutely rounded, dorsal surface not setose and with a medial ridge 5
3. Laterocaudal angle of tergite 6 produced into a small spine; spine on laterocaudal angle of tergite 7 directed ventrocaudally *M. rothi* sp. nov.
- Laterocaudal angle of tergite 6 not produced, spine on laterocaudal angle of tergite 7 directed dorsally 4
4. Pronotal length less than 15mm; total length less than 55mm; males with weakly developed disc tubercles on pronotum *M. heppleorum* sp. nov.
- Pronotal length greater than 15mm; total length usually greater than 60mm; males with clearly developed pronotal disc tubercles *M. rhinoceros* Saussure
5. Anterolateral corners of tergites 6 and 7, and often tergite 5, with round holes 6
- Anterolateral corners of tergites without holes 7
6. Posterior margin of supraanal plate smooth, lateral corners (posterior to cerci) rounded *M. mackerassae* Roth
- Posterior margin of supraanal plate crenulate, lateral corners (posterior to cerci) produced into acute spines *M. kinkuna* sp. nov.
7. Laterocaudal angle of tergite 6 produced into a very small spine; laterocaudal angle of tergite 7 with a spine directed ventrocaudally, males with weak pre-marginal disc tubercles *M. saxicola* sp. nov.
- Laterocaudal angle of tergite 6 not produced;

- laterocaudal angle of tergite 7 directed laterally or dorsally; males with strongly recurved premarginal disc tubercles 8
8. Posterior margin of tergite 6 with a broadly rounded peak 3-5mm from lateral margin; margin of supraanal plate smooth
 *M. lithgowae* sp. nov.
- Tergite 6 with lateral two thirds of posterior margin thickened evenly; margin of supraanal plate smooth or weakly crenulate
 *M. monteithi* Roth

***Geoscapheus rugulosus* sp. nov.**
(Fig. 2)

MATERIAL EXAMINED

HOLOTYPE: ♂, Blackdown Tableland, Expedition Range, 23°48.5'S 149°03.5'E, dug up, 16.xii.1986, HAR, DR, L. Sanchez, JRW, QM.

PARATYPES: 2 ♂, same data as holotype, QM; 1 ♀, Blackdown Tableland, Blackdown Base, 23°33'S 149°39'E, dug up, 5.iv.1988, HAR, QM; 1 ♂, 1 ♀, Blackdown Tableland, Expedition Range, 23°49'S 149°04'E, dug up, 25.vi.1992, BRR, HAR, JAW, JRW, ANIC.

OTHER MATERIAL: 5 ♂, 3 ♀, 3 ♂ nymphs, 2 ♀ nymphs, Blackdown Tableland, Expedition Range, 23°48.5'S 149°03.5'E, dug up, 16.xii.1986, HAR, DR, L. Sanchez, JRW, USIC; 5 ♂, 1 ♀, Blackdown Tableland, Blackdown Base, 23°33'S 149°39'E, dug up, 5.iv.1988, HAR, USIC; 3 ♀, 7 ♂ nymphs, 6 ♀ nymphs, Blackdown Tableland, Expedition Range, 23°49'S 149°04'E, dug up, 25.vi.1992, BRR, HAR, JAW, JRW, USIC.

DESCRIPTION

Male

Colour. Head ferruginous, basal half of clypeus labrum genae and mandibles black; pronotum ferruginous laterally, darker to black medially and anteriorly; meso- and metanotum ferruginous laterally, dark brown to black medially; legs ferruginous, tibia and spines black; abdominal tergites very dark brown to black; supraanal plate black; S2-6 black laterally, ferruginous medially; S7 dark brown to black laterally and posteriorly, ferruginous antero-medially; subgenital plate dark brown; cerci dark brown; dorsal surface matt; ventral surfaces shiny.

Measurements. Total length 52.7 (51.0-55.8), pronotal length x width 16.3 x 27.7 (15.2-17.5 x 26.0-28.9).

Head. Densely punctate, hidden under

pronotum, frons sculptured with irregular fine grooves.

Thorax. Pronotum convex, subsemicircular, with a medial premarginal thickening forming a broad transverse tubercle (Fig. 2D); disc depressed posterior to tubercle to 2-3mm from posterior margin which is thickened medially, floor of depression roughened and granular behind anterior tubercle and anterior to a pair of oblique anterior grooves, posterior portion of depression relatively smooth; pronotum strongly and densely punctate; meso- and metanotum punctate and finely grooved, punctations larger and denser laterally; anteroventral margin of front femur with 2 or 3 large spines basally and a small distal spine, posterior margin with a large distal spine.

Abdomen. T1-6 punctate and with fine irregular grooving, punctations larger and denser laterally, grooved sculpturing more pronounced medially; laterocaudal angle of T6 produced into a large dorsally reflexed spine (Fig. 2C); T7 strongly and densely punctate, lateral margins concave, laterocaudal angle produced into a short slightly upturned oblique spine; supraanal plate strongly and densely punctate, laterocaudal angle slightly produced obtusely, posterior margin slightly upturned and weakly undulate; sternites punctate, punctations stronger and denser laterally; S7 broadly rounded, concavely truncated posteriorly exposing subgenital plate; subgenital plate punctate; cerci bulbous, tapering to an obtusely rounded tip, proximal half with a dorsal medial ridge, densely setaceous ventrally except on anterior margin, dorsal surface nonsetose anteriorly, setaceous on posterior margin and sparsely setaceous posterior to medial ridge; genitalia developed but variable, L2d absent, L2vm present, L1 present but often weakly sclerotised, R2 varies from a short weakly sclerotised mound to a strong hook (Fig. 2B,E).

Female

Differs from male as follows: pronotum without premarginal thickening, disc hardly if at all depressed, posterior margin hardly thickened; body more dorsoventrally compressed; S7 not truncated posteriorly; subgenital plate absent.

Measurements. Total length 50.4-51.9, pronotal length x width 13.8-15.0 x 24.9-27.5.

Nymph

Similar to adult but without adult pronotal characters, Usually lighter in colour than adults particularly ventrally.

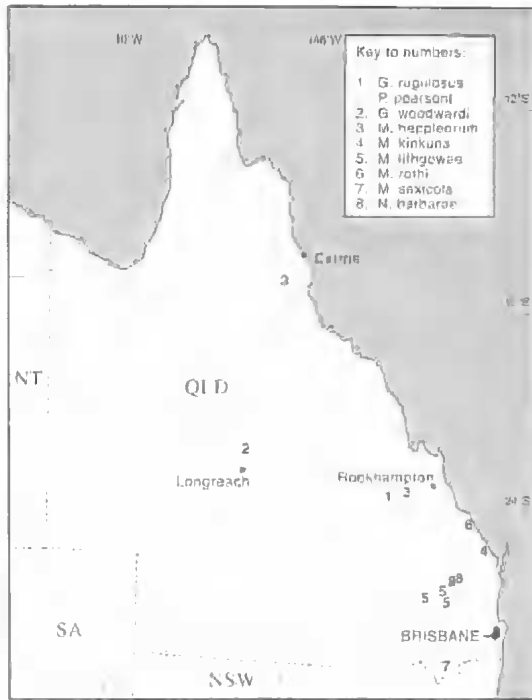


FIG. 1. Distribution of the 9 new species.

DISTRIBUTION AND BIOLOGY

This species occurs at two locations on the Blackdown Tableland. Blackdown Base has a loose grey sandy soil with *Eucalyptus*. Expedition Range has open *Eucalyptus* forest with an under cover of mostly quinine bushes on a fine orange loam.

REMARKS

In the subfamily, this species has the most matt texture and is most dorsoventrally compressed. Males are easily distinguished from the other *Geoscaphes* by their single pronotal tubercle.

ETYMOLOGY

Latin *rugulosus*, minutely wrinkled.

Geoscaphes woodwardi sp. nov. (Figs 3A,B; 4A,B)

MATERIAL EXAMINED

HOLOTYPE: ♂, Mt Cornish, 7km NE of Muttaborra, 22°34'S 144°35'E, dug up, 23.vi.1992, BRR, HAR, JAW, JRW, QM.

PARATYPES: 2 ♂, 1 ♀, same data as holotype, QM; 1 ♂, 1 ♀, same data as holotype, ANIC.

OTHER MATERIAL: Queensland: 2 ♀, 4 ♂ nymphs, 5

♀ nymphs, same data as holotype, USIC; 4 nymphs, Muttaborra, 13-16.X.1968, G.B. Monteith.

DESCRIPTION

Male

Colour. Head and antennae black; pronotum black anteriorly and medially, cream to castaneous posterolaterally, posterolateral punctations often brown or black, lateral and posterior margins black; meso- and metanotum cream to light tan, castaneous flecks and patches medially, a short castaneous to black longitudinal bar on anterior margin between midline and lateral margin, lateral and posterior margins black, ventral surfaces cream to light tan laterally, ventral surface of pronotum black, legs black, trochanters and anterior femoral margin light brown basally; tergites castaneous, anterior margins darker, supraanal plate castaneous; S2-6 castaneous laterally, dark brown to black medially; S7 castaneous, dark brown to black posteromedially; subgenital plate dark brown to black posteromedially; subgenital plate dark brown, anterior margin black; cerci black basally, castaneous to brown apically; dorsal and ventral surfaces shiny.

Measurements. Total length 37.5 (33.5-42.6), pronotal length x width 10.9 x 16.8 (9.9-11.1 x 15.5-18.4).

Head. Hidden under pronotum, finely punctate.

Thorax. Pronotum convex, subsemicircular, anterior margin curved obliquely upwards medially; disc depressed 2-3mm from anterior margin to 3-4mm from posterior margin, floor of depression granular and with a pair of oblique anterior grooves, posterior portion of depression less granular and with a pair of blunt disc tubercles (Fig.4B); pronotum finely punctate; meso- and metanotum finely and sparsely punctate, punctations denser laterally, lateral margins often with fine hairs; anteroventral margin of front femur with 3-4 large spines basally and usually a very small spine distally, posterior margin with a large distal spine.

Abdomen. T1-7 smooth to very weakly and sparsely punctate medially, weakly punctate laterally; laterocaudal angles of T2-5 broadly rounded and projecting slightly beyond lateral margin of previous tergite; laterocaudal angle of T6 produced into a short blunt spine directed obliquely and slightly dorsad (Fig.4A); laterocaudal angle of T7 produced into a short blunt spine directed obliquely and laterally (Fig. 4A); supraanal plate punctate, punctations denser posteriorly, laterocaudal angle hardly produced, posterior margin smooth; S2-5 punctate laterally,

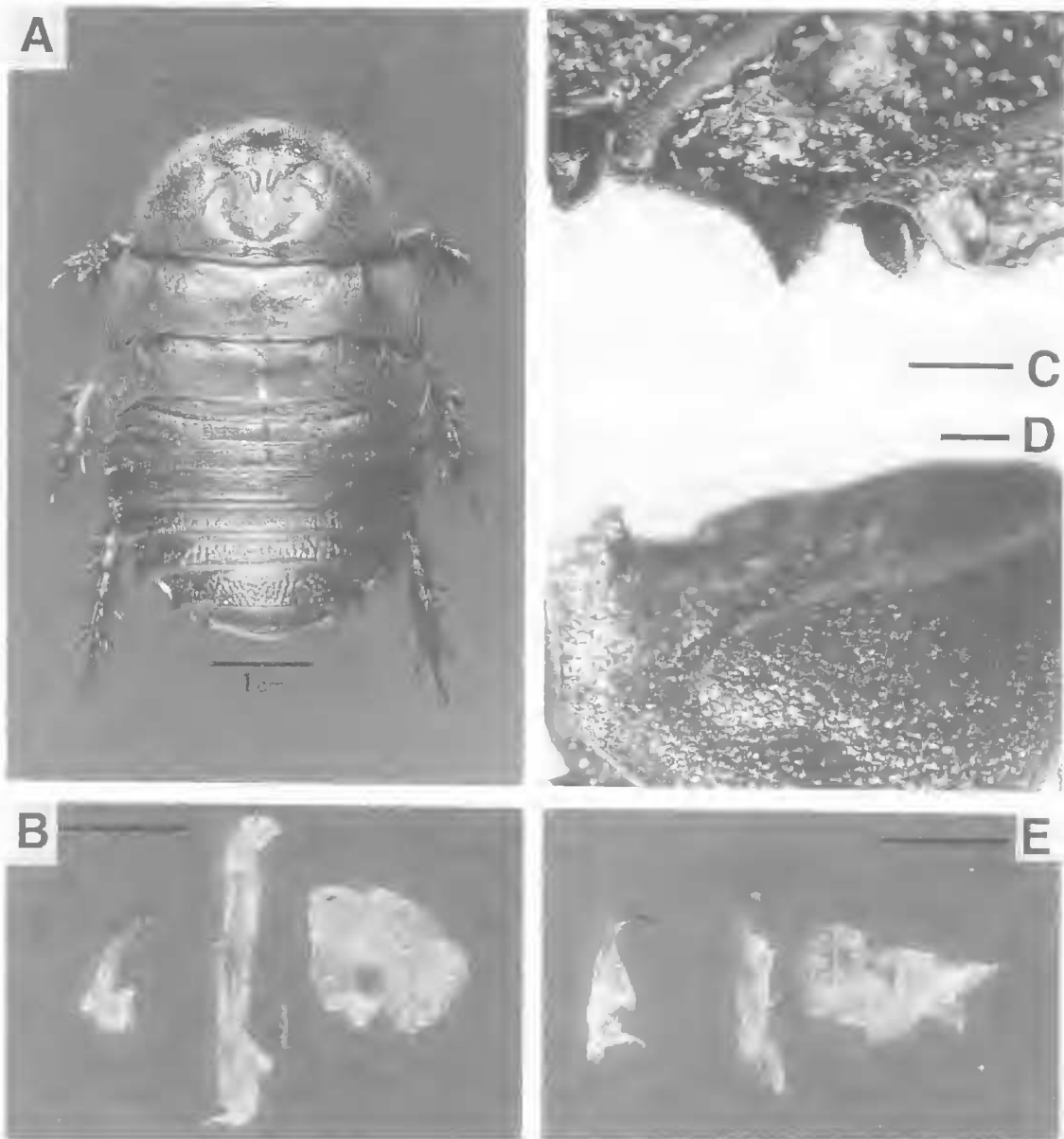


FIG. 2. *Geoscapheus rugulosus* sp. nov. A-D, holotype ♂; E, paratype ♂. A, habitus, dorsal view; B, genitalia, R2-L2vm-L1; C, laterocaudal angle of T6, lateral margin of T7, laterocaudal angle of supraanal plate, dorsal view; D, pronotum, lateral view; E, genitalia, R2-L2vm-L1.

sparingly punctate medially; S7 broadly rounded, concavely truncated posteriorly, punctate laterally and posteriorly, sparsely punctate anteromedially; subgenital plate punctate; cerci acutely triangular, tapering to a rounded point apically, dorsal surface smooth to finely and sparsely punctate, concave basally either side of a weak dorsal ridge, ventral surface slightly bulbous and

densely setaceous medially; genitalia not fully developed, L2d absent, L2vm present, L1 absent or very weakly developed and hardly sclerotised, R2 ranges from an unsclerotised mound to a short sclerotised spur (Fig. 3B).

Female

Differs from male as follows: anterior margin

of pronotum less curved dorsally, disc less depressed, disc tubercles absent; lateral areas of pro-, meso- and metanotum tending towards yellowish brown or orange rather than cream; brown longitudinal bars on anterior margin of meso- and metanotum not as defined as in males; posterior margin of S7 convexly truncated posteriorly; no subgenital plate; larger than male.

Measurements. Total length 37.9–43.3, pronotal length x width 11.1–12.2 x 16.6–19.0.

Nymph

Similar to adult but without adult pronotal characters; cream on thoracic nota does not extend so far medially as in adults.

DISTRIBUTION AND BIOLOGY

Known only from the type locality in mixed open forest in sandy soil in overflow channels of the Thomson River. Most burrows were found below overhanging branches of *Acacia* spp.

REMARKS

This is the second species known which is bicoloured. Nymphs of this species are very similar to nymphs of *M. kraussiana*, possessing pale edged nota.

ETYMOLOGY

For Jim Woodward who assisted in the field.

Macropanesthia heppleorum sp. nov. (Figs 3C,D; 4C,D)

MATERIAL EXAMINED

HOLOTYPE: ♂, Pine Trees Pony Stud, 10km E of Innot Hot Springs, Queensland, 17°40'S 145°14'E, dug up, 23.ii.1991, B. Hepple, QM.

PARATYPES: 1 ♂, 1 ♀, same location as holotype, dug up, 17.xi.1987, HAR, QM; 1 ♂, same location as holotype, dug up, 17.xi.1987, HAR, ANIC; 1 ♀, same data as holotype, ANIC.

OTHER MATERIAL: 2 ♂, 2 ♀, same data as holotype, USIC; 9 ♂, 10 ♀, 1 ♂ nymph, same location as holotype, dug up, 17.xi.1987, HAR, USIC; 2 ♀, 1 ♂ nymph, same location as holotype, dug up, 7.ii.1989, B. Hepple, USIC; 1 ♂, 2 ♂ nymphs, 1 ♀ nymph, same location as holotype, dug up, 27.ix.1992, HAR, JAW, USIC; 5 ♂, 2 ♀, 1 ♂ nymph, 2 ♀ nymphs, 'Yarra' 20km NE of Daringa, dug up, 2.i.1989, G. Smith, USIC; 7 ♂, 1 ♀, 'Yarra' 20km NE of Daringa, dug up, 1.ii.1989, G. Smith, USIC; 2 ♂, 1 ♀, 1 ♀ nymph, 'Yarra' 20km NE of Daringa, dug up, 1.iii.1989, G. Smith, USIC; 1 ♂, Gogango, via Rockhampton, 12.viii.1967, C. Chopping, UQIC.

DESCRIPTION

Male

Colour. Head dark brown to black, clypeus pale brown apically; pronotum ferruginous laterally and posteromedially, dark brown to black anteriorly and medially; meso- and metanotum ferruginous, dark brown posterolaterally; legs tan to ferruginous, tibia spines and tarsi dark brown to black; abdominal tergites ferruginous to dark brown; supraanal plate dark brown to black; S2–6 tan to ferruginous medially, dark brown to black laterally, S7 ferruginous anteromedially, dark brown to black laterally and posteriorly; subgenital plate ferruginous to dark brown; cerci dark brown basally, light brown apically; dorsal and ventral surfaces shiny.

Measurements. Total length 48.9 (49.9–51.9), pronotal length x width 13.5 x 21.0 (14.4–14.5 x 20.4–20.8).

Head. Finely and sparsely punctate, hidden under pronotum, frons slightly depressed above clypeus.

Thorax. Pronotum convex, subsemicircular, anterior margin slightly thickened and upturned (Fig. 4D), disc depressed weakly anterior to a pair of oblique anterior grooves arising from the centre of the pronotum, floor of depression roughened and granular, a pair of feeble separated disc tubercles present posterior to oblique grooves, finely and sparsely punctate posteriorly and laterally; meso- and metanotum finely and sparsely punctate, punctations stronger laterally; anteroventral margin of front femur with 2–3 large spines basally and a small spine distally, posterior margin with a large distal spine.

Abdomen. T1–6 smooth to very finely and sparsely punctate medially; T2–6 punctate laterally with stronger punctations in anterior corners, a row of punctations extending along anterior margin but not medially, punctations becoming slightly stronger and denser in posterior tergites; lateral margins of T7 concave, laterocaudal angle produced into a large acute spine strongly reflexed dorsally (Fig. 4C); supraanal plate punctate, anterior margin smooth, laterocaudal angle slightly produced obtusely, posterior margin slightly upturned and entire or weakly undulate; S2–6 punctate laterally, smooth medially; S7 punctate laterally and posteriorly, smooth anteromedially, broadly rounded and concavely truncated posteriorly exposing subgenital plate; subgenital plate punctate; cerci bulbous, with a broadly rounded tip, densely setaceous ventrally, dorsal surface nonsetose except apical margins

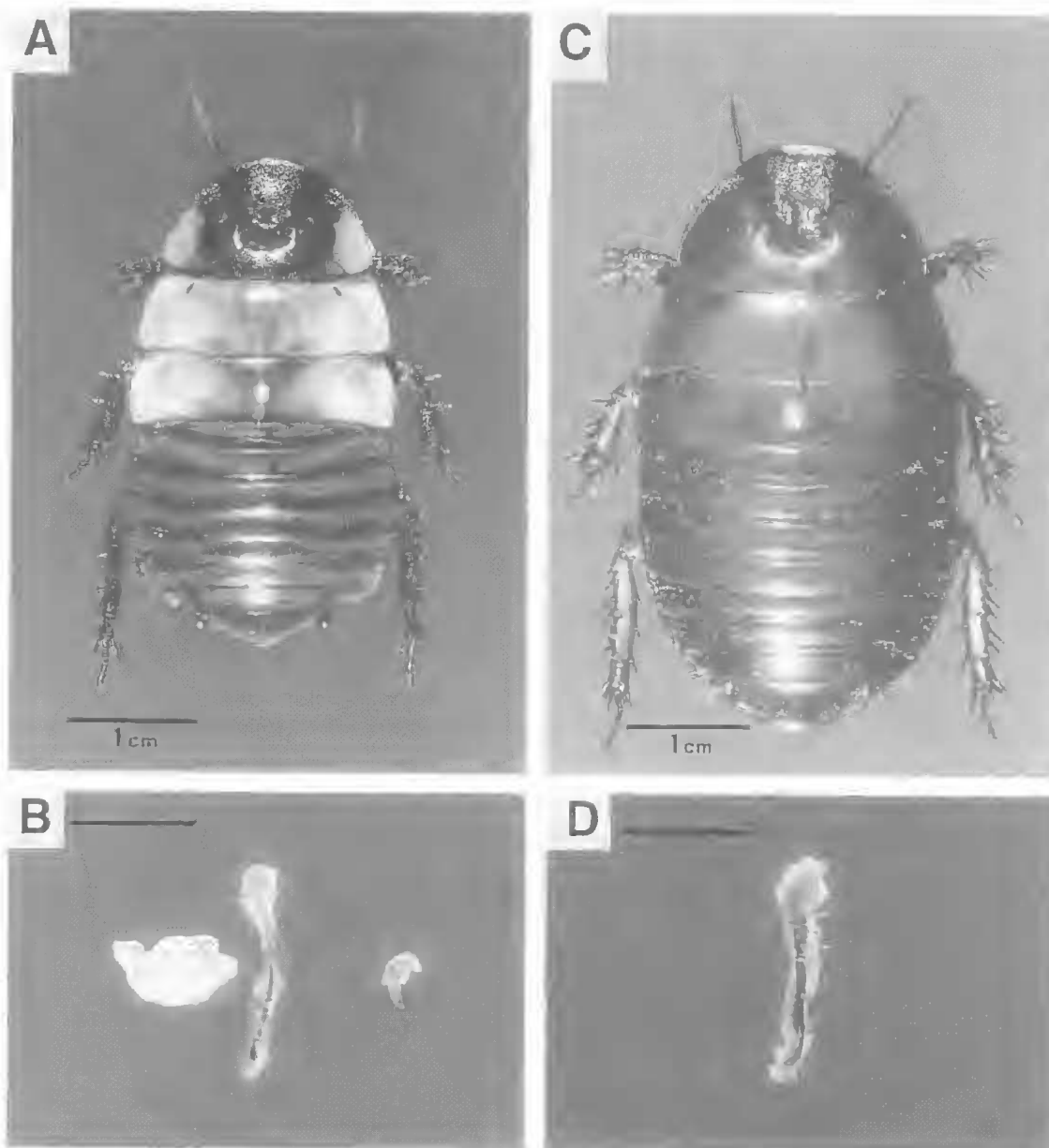


FIG. 3. A,B, *Geoscapheus woodwardi* sp. nov., holotype ♂; C,D, *Macropanesthia heppleorum* sp. nov., holotype ♂. A-C, habitus, dorsal view; B, genitalia, L1-L2vm-R2; D, genitalia, L2vm.

and with a weak medial ridge; genitalia reduced, L2d, L1 and R2 absent, L2vm present (Fig. 3D).

Female

Differs from male as follows: pronotum without disc tubercles, anterior margin only slightly thickened and upturned, disc only slightly depressed; S7 broadly rounded but not con-

cavely truncated posteriorly; subgenital plate absent.

Measurements. Total length 45.7–48.2, pronotal length x width 12.2–12.8 x 18.8–20.1.

Nymph

Similar to adults but without adult pronotal

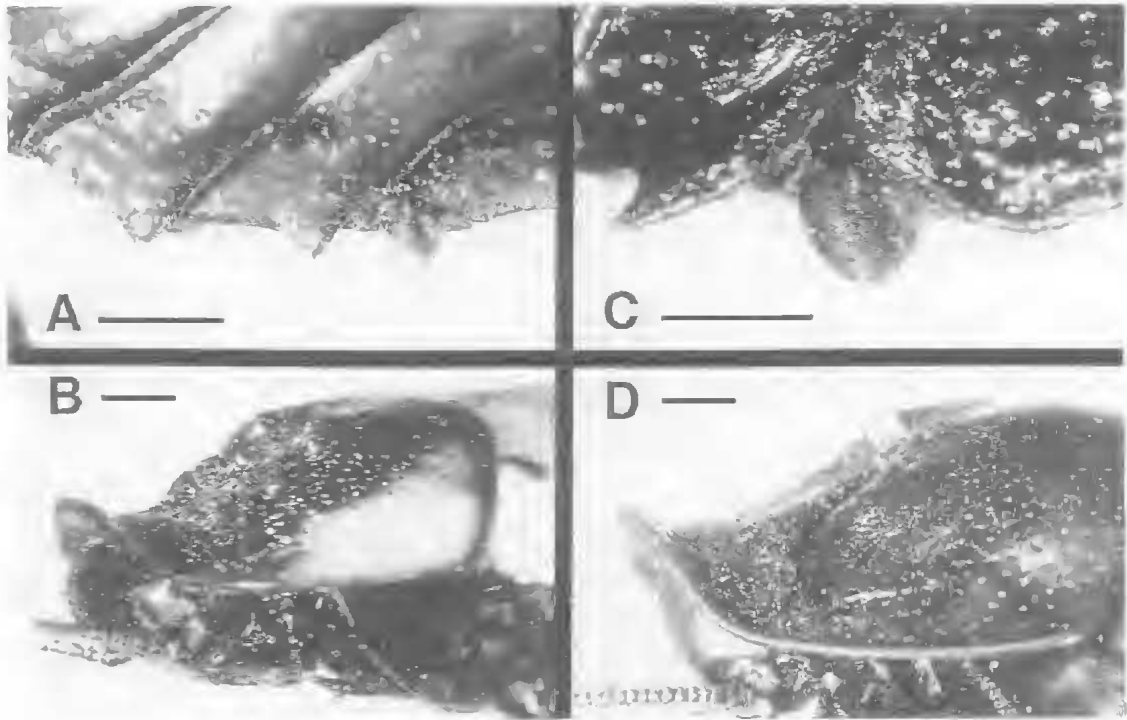


FIG. 4. A,B, *Geoscaphes woodwardi* sp. nov., holotype ♂; C,D, *Macropanesthia heppleorum* sp. nov., holotype ♂. A,C, lateral margins of T6-T7 supraanal plate, dorsal view; B, D, pronotum, lateral view.

characters; laterocaudal angle of T7 not as produced or reflexed.

DISTRIBUTION AND BIOLOGY

M. heppleorum is known from two widely separated areas; the population near Mt Garnet is 800km N of those around Daringa. Specimens have been dug from grey sandy loams to hard packed red soil amongst brigalow roots. Vegetation is usually *Callitris-Eucalyptus* forest.

REMARKS

In both areas where *M. heppleorum* is found, *M. rhinoceros* is nearby but not sympatric. This species is similar to *M. rhinoceros* but smaller. The Gogango specimen (C. Chopping, 1967, UQIC) was identified by L.M. Roth in 1974 as a male nymph of *M. rhinoceros*. It is, however, an adult and similar to those specimens from 'Yarra', 20km NE of Daringa.

Adult males can be distinguished from small specimens of *M. rhinoceros* by having less pronotal development, disc tubercles are smaller and the anterior margin less dorsally curved. A further distinction of *M. rhinoceros* is its adult pronotal

length of greater than 15mm versus less than 15mm for *M. heppleorum*.

ETYMOLOGY

For Don and Betty Hepple on whose former property this species is abundant.

Macropanesthia kinkuna sp. nov. (Figs 5A-D; 6A,B)

MATERIAL EXAMINED

HOLOTYPE: ♂, Kinkuna National Park 15km SE of Bundaberg, Queensland, 25°00'S 152°29'E, dug up, 21.iv.1992, D. Cook, G. B. Monteith, QM.

PARATYPES: 1 ♂, same data as holotype, ANIC; 1 ♂, 10km S of Gollow, 25°00'S 152°23'E, dug up, 5.vii.1992, HAR, JAW, JRW, QM; 1 ♂, 10km S of Gollow, 25°00'S 152°23'E, dug up, 5.vii.1992, HAR, JAW, JRW, ANIC; 1 ♂, 1 ♀, Coonarr Beach, 10km S of Bundaberg, 25°55'S 152°29'E, dug up, 6.vii.1992, HAR, JAW, JRW, QM.

OTHER MATERIAL: 1 ♂, 1 ♀, 2 ♂ nymphs, same data as holotype, USIC; 5 ♂, 1 ♀, 3 ♂ nymphs, 5 ♀ nymphs, same data as Coonarr Beach paratypes, USIC; 3 ♂ nymphs, same data as Gollow paratypes, USIC.

DESCRIPTION

Male

Colour. Head ferrugineous, frons genae and mandibles black, clypeus tan apically; pronotum ferrugineous laterally, dark brown to black medially; meso- and metanotum ferrugineous; legs dark tan to ferrugineous, tibia darker; abdominal T1 ferrugineous, T2–7 dark brown to black; supraanal plate black; S2–6 dark tan medially, black laterally; S7 dark brown to black, brown anteromedially; subgenital plate dark brown; cerci ferrugineous apically and on dorsal medial ridge, dark brown to black dorsobasally either side of medial ridge, light brown ventrobasally; pro-, meso- and metanotum shiny; T1–6 shiny; T7 and supraanal plate matt; ventral surface shiny.

Measurements. Total length 41.2 (32.2–41.8), pronotal length x width 11.0 x 18.5 (8.9–11.6 x 14.9–18.7).

Head. Projecting slightly beyond pronotum, smooth, frons slightly depressed above clypeus.

Thorax. Pronotum very finely and sparsely punctate laterally, convex subsemicircular, with a medial premarginal thickening forming a rounded tubercle (Fig. 5D); disc depressed posterior to tubercle to 2–3 mm from posterior margin which is thickened medially, floor of depression finely granular posterior to premarginal tubercle and anterior to a pair of oblique anterior grooves, slightly roughened posterior to oblique anterior grooves; meso- and metanotum with very fine sparse punctations; anteroventral margin of front femur with 2–4 large spines basally, a very small and often absent spine distally; posterior margin of front femur with a large distal spine.

Abdomen. T1 smooth; T2–6 with punctations laterally, punctations becoming stronger from T2 to T6, medial punctations becoming stronger and denser from T2–6 with T2 being very finely and sparsely punctate and T6 strongly and densely punctate; laterocaudal angle of T6 slightly produced forming a small caudally directed spine; T7 strongly and densely punctate, laterocaudal angle produced into an acute oblique spine curved dorsally (Fig. 5C); T6 and T7 (sometimes T5) with anterolateral holes (Fig. 6B); supraanal plate strongly and densely punctate over all but anterior margin which is smooth; laterocaudal angle of supraanal plate produced acutely, rounded apically, with convex outer margins and concave inner margins, posterior margin strongly crenulate (Fig. 6A); S2–6 punctate laterally, smooth to very weakly

and sparsely punctate medially; S7 broadly rounded, punctate laterally and posteromedially, smooth anteromedially, transversely to weakly concavely truncated posteriorly exposing subgenital plate; subgenital plate finely punctate; cerci bulbous and densely; setaceous ventrally (Fig. 5C), tapering to an acute tip apically, dorsal surface smooth to sparsely and very finely punctate, concave basally either side of a strong dorsal medial ridge; genitalia developed, L2d absent, L2vm and L1 present, R2 developed into a full hook (Fig. 5B).

Female

Differs from male as follows: pronotum, anterior margin only slightly thickened, tubercle weak, disc depression posterior to oblique grooves less pronounced, posterior margin not thickened; S7 not concavely truncated posteriorly; no subgenital plate.

Measurements. Total length 36.4–39.0, pronotal length x width 9.5–10.2 x 15.8–18.0.

Nymph

Similar to adult but without adult pronotal characters.

DISTRIBUTION AND BIOLOGY

From 3 locations within a few km in or near Kinkuna National Park. It is found in grey sandy loam amongst *Eucalyptus/Banksia* forest, *Casuarina* stands, *Callitris*, and thick heath.

REMARKS

Although superficially similar to *M. mackerrasae* this species is distinguished on its crenulate supraanal plate margins.

ETYMOLOGY

For Kinkuna National Park.

Macropanesthia kraussiana (Saussure)
(Fig. 5E)

MATERIAL EXAMINED

LECTOTYPE: ♂, Melbourne, Victoria, in the Geneva Museum (not examined).

OTHER MATERIAL: Queensland: 1 ♂, 1 ♀, 1 ♂ nymph, Isisford, sand ridge on road to 'Mons' homestead, dug up, 20.ix.1990, G. Lithgow, USIC; 3 ♂, 3 ♀, 4 ♂ nymphs, 8 ♀ nymphs, 'Mons' 5 km S of Isisford, 24°18'S 144°26'E, dug up, 21.vi.1992, BRR, HAR, JAW, JRW, USIC. New South Wales: 1 ♀ nymph, MMUS; 1 ♀, Caltgeena Creek, dug up, ix.1988, HAR, USIC; 1 ♀, 77 km W of Cobar, 6.xi.1990, HAR, USIC;

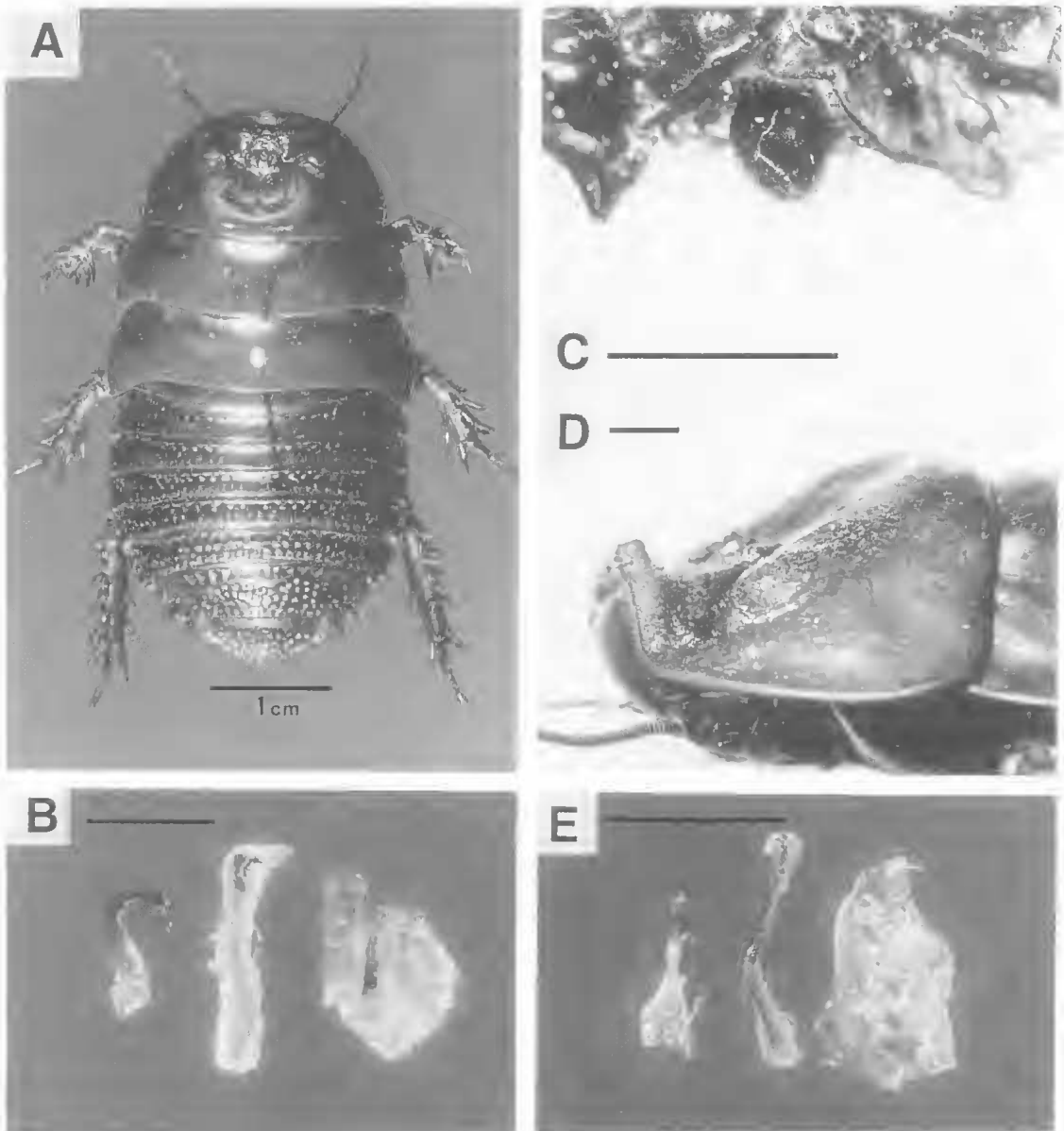


FIG. 5. A-D, *Macropanesthia kinkuna* sp. nov., holotype ♂; E, *Macropanesthia kraussiana* (Saussure), ♂ Mons, Queensland. A, habitus, dorsal view; B,E, genitalia, R2-L2vm-L1; C, laterocaudal angle of T7, lateral margin of supraanal plate, dorsal view; D, pronotum, lateral view.

2 ♀, 3 ♂ nymphs, 3 ♀ nymphs, NW edge of Lake Popiltah, 33°08'S 141°43'E, dug up, 8.xi.1990, HAR, USIC.

MALE GENITALIA

Much reduced. L2d is absent and L2vm present. L1 is weakly developed and is present only as a weakly sclerotised line. R2 is a short

weakly sclerotised spur or may be absent (Fig. 5E).

REMARKS

When the Panesthiinae were revised by Roth (1977) he examined three specimens, from Rockhampton, New South Wales and Melbourne. He concluded *M. kraussiana* had a wide distribution.

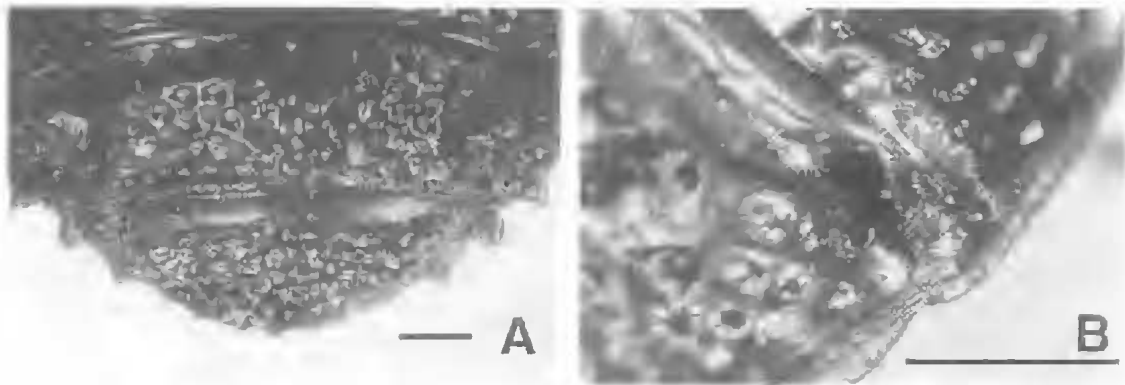


FIG. 6. *Macropanesthia kinkuna* sp. nov., holotype ♂, dorsal view. A, T7 and supraanal plate; B, lateral portion of anterior margin of T6.

Melbourne seems an unlikely habitat for this species since all other known records are in semi-arid areas. Nevertheless, it ranges over wide areas in Queensland and New South Wales.

***Macropanesthia lithgowae* sp. nov.**
(Figs 7A,B; 8A-C)

MATERIAL EXAMINED

HOLOTYPE: ♂, Nudley State Forest, 20km N of Jandowae, 26°32'S 151°00'E, dug up, 18.xii.1986, HAR, JRW, QM.

PARATYPES: 1 ♀, 'Allinga' Homestead, 8km N of Chinchilla, 26°41'S 150°38'E, dug up, 11.iv.1988, G. Lithgow, ANIC; 1 ♂, same location as holotype, dug up, 3.vii.1992, BRR, HAR, JAW, JRW, ANIC; 1 ♀, same location as holotype, dug up, 3.vii.1992, BRR, HAR, JAW, JRW, QM; 1 ♂, 1 ♀, Jinghi Valley Road, 9km N of Jandowae, 26°41'S 151°05'E, dug up, 4.vii.1992, BRR, HAR, JAW, JRW, QM.

OTHER MATERIAL: 1 ♂, 2 ♀, 1 ♂ nymph, same location as holotype, dug up, 20.xii.1987, HAR, USIC; 1 ♂, Chinchilla, dug up, xii.1987, HAR, USIC; 1 ♂, 4 ♀, same location as holotype, dug up, 12-13.v.1988, HAR, USIC; 1 ♂, 2 ♀, 5 ♂ nymphs, 5 ♀ nymphs, laboratory born from adults collected at holotype location, HAR, USIC; 3 ♂, 5 ♀, same location as holotype, dug up, 26.ii.1988, HAR, JRW, USIC; 1 ♂, 1 ♀, same location as holotype, dug up, 18.xii.1986, HAR, JRW, USIC; 2 ♂, 5 ♀, 3 ♂ nymphs, 1 ♀ nymph, same location as holotype, dug up, 3.vii.1992, BRR, HAR, JAW, JRW, USIC; 1 ♂ nymph, 'Gilgunya' Nudley State Forest, dug up, 3.vii.1992, JAW, USIC; 1 ♂, 1 ♀, 4 ♂ nymphs, 4 ♀ nymphs, Jinghi Valley Road, 9km N of Jandowae, 26°41'S 151°05'E, dug up, 4.vii.1992, BRR, HAR, JAW, JRW, USIC; 1 ♂, 1 ♀, Jinghi Valley Road, 9km N of Jandowae, 26°41'S 151°05'E, dug up, 14.v.1988, HAR, USIC; 2 ♀, 2 ♂ nymphs, 2 ♀

nymphs, Monmouth, 4km NE of Chinchilla, dug up, 23.iv.1988, HAR, USIC; 3 ♂, 2 ♀, 1 ♂ nymph, 'Allinga' Homestead, 8km N of Chinchilla, 26°41'S 150°38'E, dug up, 13.v.1988, HAR, USIC.

DESCRIPTION

Male

Colour Head dark brown to black, vertex slightly ferruginous; pronotum ferruginous laterally and along posterior margin, dark brown anteromedially and around disc; meso- and metanotum ferruginous; coxae, tibia, profemora and tarsi dark brown; trochanters meso- and metafemurs light brown; tergites and supraanal plate ferruginous to dark brown; S2-6 dark brown to black laterally, ferruginous to brown medially; S7 dark brown to black, brown anteromedially; subgenital plate dark brown; cerci ferruginous; dorsal and ventral surfaces shiny.

Measurements. Total length 46.0 (41.2-42.3), pronotal length x width 11.9 x 18.1 (11.0 x 16.8-18.3).

Head. Weakly and very finely punctate, hidden under pronotum, depressed above clypeus.

Thorax. Pronotum convex, subsemicircular; anterior margin often slightly indented medially, with a premarginal thickening forming a pair of slightly recurved rounded tubercles (Fig.8B); disc depressed posterior to tubercles to 2-3mm from posterior margin; floor of depression roughened and slightly transversely striate immediately posterior to tubercles, with a pair of oblique anterior grooves meeting in centre of disc depression, often with two very weak tubercles immediately anterior to junction of oblique grooves; finely punctate anteriorly adjacent to premarginal tubercles and laterally, smooth

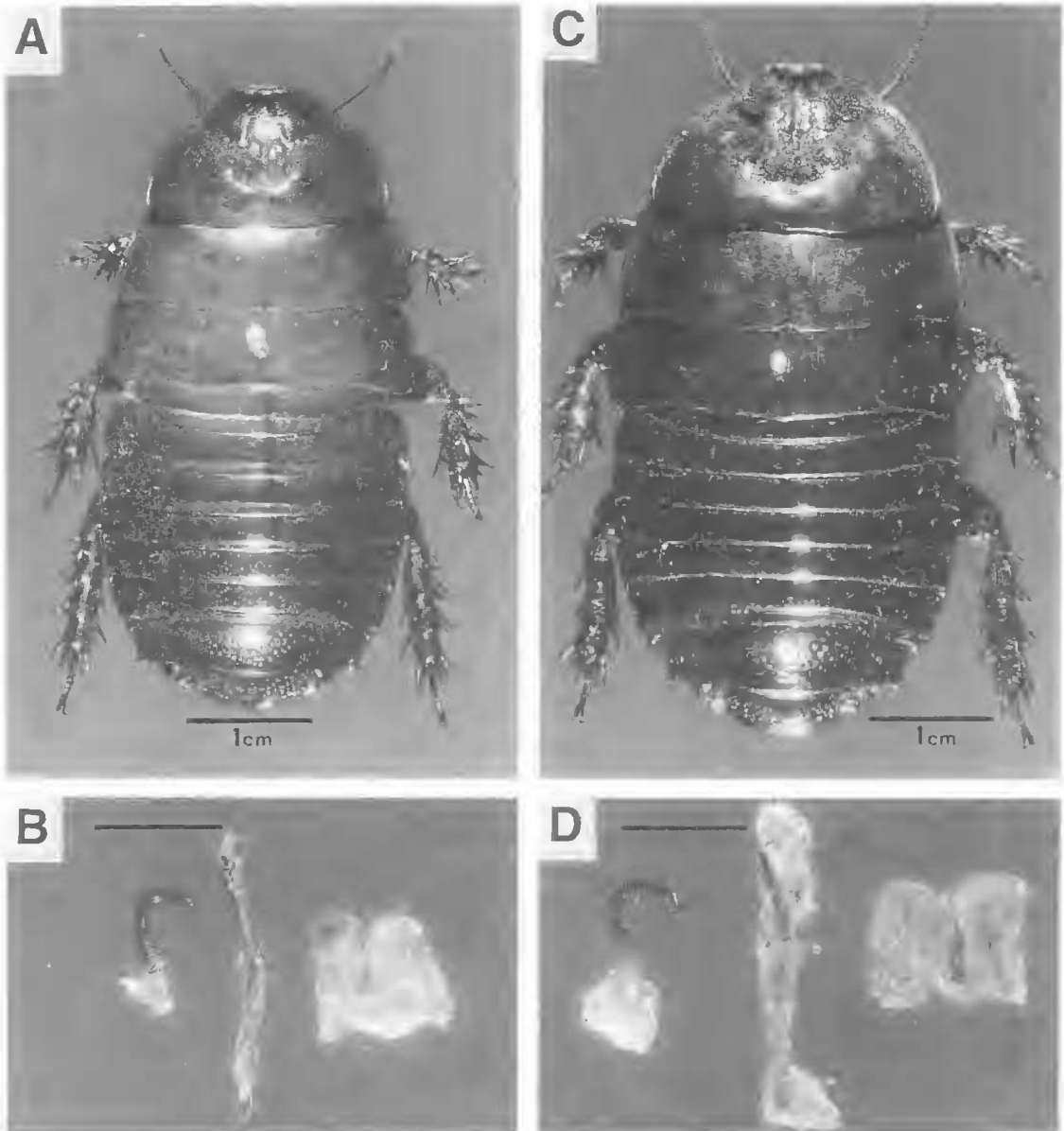


FIG. 7. A,B, *Macropanesthia lithgowae* sp. nov., holotype ♂; C,D, *Macropanesthia monteithi* Roth, ♂ Hivesville, Queensland. A,C, habitus, dorsal view; B,D, genitalia, R2-L2vm-L1.

posteromedially; meso- and metanotum smooth to very weakly and sparsely punctate laterally; anteroventral margin of front femur with 2-4 (usually 3) large spines basally and a small spine distally, posterior margin with a large distal spine.

Abdomen. T2-5 punctate laterally, T2-4 being weaker, smooth to very finely and sparsely punctate medially; T6 punctate laterally becoming sparse and fine medially, posterior margin

thickened laterally producing a broadly rounded ridge ending before lateral margin (Fig. 8C); T7 punctate except on anteromedial margin, laterocaudal angle produced into an acute spine directed obliquely and curved dorsally (Fig. 8A); supraanal plate punctate except anteromedially, laterocaudal angle slightly produced forming a broadly rounded obtuse spine directed caudally, posterior margin smooth: S2-6 strongly and den-

sely punctate laterally, S3–6 very finely and sparsely punctate to smooth medially; S7 strongly punctate laterally, weakly punctate posteriorly, smooth anteromedially, broadly rounded, concavely truncated posteriorly exposing subgenital plate; subgenital plate smooth; cerci broadly triangular with a rounded tip, dorsal surface non-setose and with a medial ridge basally, setaceous ventrally except on apical margins; genitalia well developed, L2d absent, L2vm and L1 present, R2 developed into a strong sclerotised hook (Fig. 7B).

Female

Differs from male as follows: pronotum without premarginal tubercles, disc less depressed; S7 broadly rounded but not concavely truncated posteriorly; subgenital plate absent.

Measurements. Total length 37.0–42.1, pronotal length x width 9.6–10.9 x 16.1–17.3.

Nymph

Similar to adults but without adult pronotal characters (disc depression and tubercles).

DISTRIBUTION AND BIOLOGY

Common in the Chinchilla and Jandowae areas: *N. hirsutus* occurs at Burra Burra, only a few km from *M. lithgowae* in Nudley State Forest. Some areas have high population densities with more than one burrow/m². It occurs in sandy loamy soil in open sclerophyll forests with *Eucalyptus* and *Callitris*.

REMARKS

Although similar to *N. hirsutus* it lacks the rounded tubercle.

ETYMOLOGY

For Grace Lithgow, a naturalist, on whose property the species occurs.

Macropanesthia monteithi Roth (Figs 7C,D: 8D–F)

MATERIAL EXAMINED

HOLOTYPE: ♀, Stonelands, Qld., 1.iii.1964, B. Genn, MT.7212.

PARATYPE: ♂, Sydney, A. & F. R. Zietz, SAM.

OTHER MATERIAL: Queensland: 3 ♂, Hivesville, dug up, 25.i.1992, HAR, USIC; 2 ♂, 1 ♂ nymph, Archookoora St. For. 23km S of Kingaroy, dug up, 26.viii.1986, HAR, USIC; 13 ♂, 7 ♀, 5 ♂ nymphs, 4 ♀ nymphs, Archookoora St. For. 23km S of Kingaroy,

dug up, 26.i.1992, HAR, USIC; 1 ♂, 3.5km NE of Proston, on surface, iv.1992, C. Kilgour, USIC.

DESCRIPTION

Male

Colour. Head ferruginous to black, frons and clypeus black; pronotum dark brown to black, disc black, meso- and metanotum ferruginous to dark brown medially, dark brown to black laterally; legs black, femurs ferruginous basally; tergites dark brown to black; sternites black laterally, ferruginous to dark brown medially; subgenital plate dark brown to black; cerci dark brown to black; ventral and dorsal surfaces shiny.

Measurements. (all males examined), total length 40.2–51.6, pronotal length x width 12.3–14.4 x 18.6–23.0.

Head. Hidden under pronotum, finely punctate.

Thorax. Pronotum convex, anterior margin indented medially, with a premarginal thickening forming a pair of rounded tubercles which are often recurved (Fig. 8E), disc depressed posterior to tubercles to 2–3mm from posterior margin, floor of depression roughened and granular and with a pair of transverse curved grooves becoming oblique then meeting in centre of disc depression, with two distinct disc tubercles on the posterolateral margin of the disc depression, remainder of pronotum smooth to finely and weakly punctate; meso- and metanotum smooth to weakly and sparsely punctate; anteroventral margin of front femur with 3–4 (rarely 5) large spines basally and a very small spine distally, posterior margin with a small distal spine.

Abdomen. T1 smooth; T2–6 smooth to finely and weakly punctate medially and weakly punctate laterally, posterior margin of T6 thickened and raised laterally forming a ridge which tapers to the lateral margin (Fig. 8F); T7 weakly punctate, lateral margin concave, laterocaudal angle produced into an acute spine directed laterally (Fig. 8D); supraanal plate punctate except medially on anterior and posterior margins, posterior margin often slightly curved upwards and may be smooth or weakly crenulate, laterocaudal angle weakly produced and broadly rounded; S2–6 smooth medially, punctate laterally; S7 smooth medially, punctate laterally, often weakly punctate posteromedially, weakly concavely truncated posteriorly exposing subgenital plate; subgenital plate smooth; cerci broadly triangular, rounded apically, with a strong dorsal medial ridge, bulbous and densely setose ventrally, setose on posterior margin, nonsetose dorsally; genitalia well developed, L2d absent, L2vm

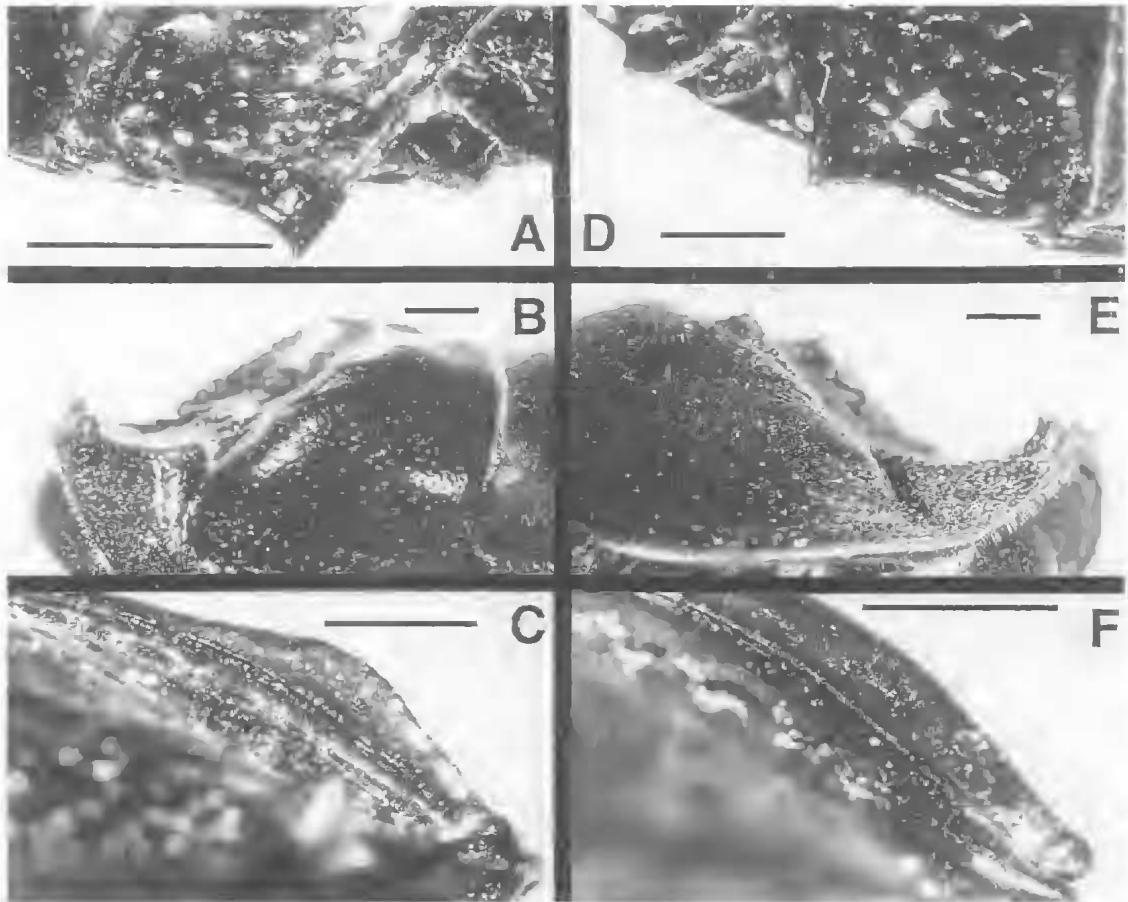


FIG. 8. A-C, *Macropanesthia lithgowae* sp. nov., holotype ♂; D-F, *Macropanesthia monteithi* Roth, ♂ Hivesville, Queensland. A,D, laterocaudal angle of T6, lateral margin of T7, dorsal view; B,E, pronotum, lateral view; C,F, lateral portion of posterior margin of T6, posterior view.

and L1 present, R2 developed into a strong sclerotised hook (Fig. 7D).

DISTRIBUTION AND BIOLOGY

Two populations in SE Queensland. Archookoora State Forest and Hivesville both have softwood scrub with scattered evergreen vine thickets on a brown to red loam, however, Archookoora is slightly wetter.

REMARKS

The original description of *M. monteithi* Roth (1977) was from an adult female collected at Stonelands, near Hivesville, and a female from Sydney. The specimens on which the male description is based are from two populations around Kingaroy. The specimen from Sydney, designated by Roth (1977) as a paratype, is not an adult and differs from nymphs collected at the

holotype location. Nymphs are extremely hard to identify as the pronotal and tergal features, which distinguish the various species, are not fully developed. The 'Sydney' nymph remains undetermined, however, it keys closest to *M. kinkuna* sp. nov.

Macropanesthia rothi sp. nov. (Figs 9B-D; 10A)

MATERIAL EXAMINED

HOLOTYPE: ♂, Wreck Rock, 12km S of Agnes Water, 24°19'S, 151°58'E, dug up, 19-26.viii.1985, A. Kotze, HAR, DR, L. Sanchez, JRW, QM.

PARATYPES: 1 ♂, data as for holotype, QM; 1 ♂, 1 ♀, Wreck Rock, 12km S of Agnes Water, 24°19'S 151°58'E, dug up, 4.v.1989, HAR, DR, JRW, ANIC; 1 ♂, Wreck Rock, 12km S of Agnes Water, 24°19'S 151°58'E, dug up, 4.v.1989, HAR, DR, JRW, QM.

OTHER MATERIAL: Queensland: 1 ♂, 1 ♀, Rainforest Pitfall 71, Rocky Point, 10km S of Round Hill Head, 1976-1977, 60m, G.B. & S.R. Monteith, QM; 1 ♀, 10.8km S of Agnes Water, dug up, 9.xii.1986, HAR, DR, L. Sanchez, JRW, USIC; 7 ♂, 3 ♀, 4 ♂ nymphs, 1 ♀ nymph, data as for holotype, USIC; 1 ♀, 2 ♂ nymphs, 1 ♀ nymph, 10.8km S of Agnes Water, dug up, 9-12.xii.1986, HAR, DR, L. Sanchez, JRW, USIC; 3 ♂, 10.8km S of Agnes Water, dug up, 14.ii.1988, HAR, DR, JRW, USIC; 1 ♀, Wreck Rock, 12km S of Agnes Water, 24°19'S 151°58'E, dug up, 4.v.1989, HAR, DR, JRW, USIC; 3 ♂, 6 ♀, 2 ♂ nymphs, 3 ♀ nymphs, Wreck Rock, 12km S of Agnes Water, 24°19'S 151°58'E, dug up, 3-5.iv.1991, A. C. Kotze, J. D. Redfern, HAR, JRW, USIC.

DESCRIPTION

Male

Colour. Head ferruginous, frons gena and mandibles dark brown; pronotum ferruginous laterally, dark brown to black medially; meso- and metanotum ferruginous laterally and posteriorly, dark brown anteromedially; legs ferruginous, spines black apically; tergites progressing from ferruginous to black from T1-7, T7 almost black; supraanal plate almost black, posterior margin ferruginous; S1-6 lightly ferruginous medially, dark brown laterally; S7 ferruginous anteromedially, dark brown laterally and posteriorly; subgenital plate ferruginous; cerci dark brown; ventral surfaces shiny; dorsal surfaces shiny anteriorly tending to matt posteriorly.

Measurements. Total length 68.3 (61.8-63.6), pronotal length x width 22.2 x 35.2 (17.5-20.0 x 28.9-32.5).

Head. Hidden under pronotum, sparsely and finely punctate, frons slightly depressed above clypeus.

Thorax. Pronotum convex, subsemicircular, with a medial premarginal thickening forming a pair of broadly rounded tubercles which are fused medially (Fig. 9C); disc depressed posterior to tubercles to 2-3mm from posterior margin which is thickened medially, floor of depression roughened and granular behind anterior tubercle and anterior to a pair of oblique anterior grooves, posterior portion of depression relatively smooth; pronotum sparsely and finely punctate, finely grooved laterally; meso- and metanotum with sparse fine punctations and fine irregular grooving; anteroventral margin of front femur with 2 or 3 (rarely 1 or 4) large spines basally, a small spine distally, hind margin with a large distal spine.

Abdomen. T1-4 sparsely punctate laterally, posterior margin of T2-3 (often T4) strongly

concave laterally (Fig. 10A), T5 and T6 with stronger denser punctations extending medially; laterocaudal angle of T6 produced into a short acute blunt spine directed posteriorly (Fig. 9D); T7 with punctations larger and denser than on anterior tergites, laterocaudal angle produced into an acute spine directed ventrocaudally (Fig. 9D); supraanal plate punctate over all except anterior margin, laterocaudal angles produced obtusely, posterior margin smooth to weakly crenulate and weakly upturned; S7 punctate laterally and medially, broadly rounded, concavely truncated posteriorly exposing subgenital plate; cerci bulbous, broadly rounded, densely setaceous (Fig. 9D); genitalia well developed but variable, L2d absent, L2vm and L1 present but often weak, R2 ranging from a weak unsclerotised spur to a fully developed hook (Fig. 9B).

Female

Differs from male as follows: pronotum with anterior margin only slightly thickened, tubercles absent, disc only slightly depressed, posterior margin not thickened; S7 with posterior margin not truncated concavely, no subgenital plate.

Measurements. Total length 63.4-64.4, pronotal length x width 18.1 x 30.7-30.8.

Nymph

Similar to adult but without adult pronotal characters, body more dorsoventrally compressed than adult. Colour, pale tan to brown for early instars, becoming darker towards final instar, final instar with sternite and legs pale brown medially.

DISTRIBUTION AND BIOLOGY

Known from within and close to Deepwater National Park in sandy, open forest to rainforest, with palms and *Casuarina* predominating, and with some *Eucalyptus*.

REMARKS

This species is similar in size to *M. rhinoceros* but more robust in the thorax and legs.

ETYMOLOGY

For Dr L. M. Roth.

Macropanesthia saxicola sp. nov. (Figs 9A,E-G; 10B)

MATERIAL EXAMINED

HOLOTYPE: ♂ Pikedale, 28°39'S 151°37'E, dug up, 7.xii.1991, HAR, QM.

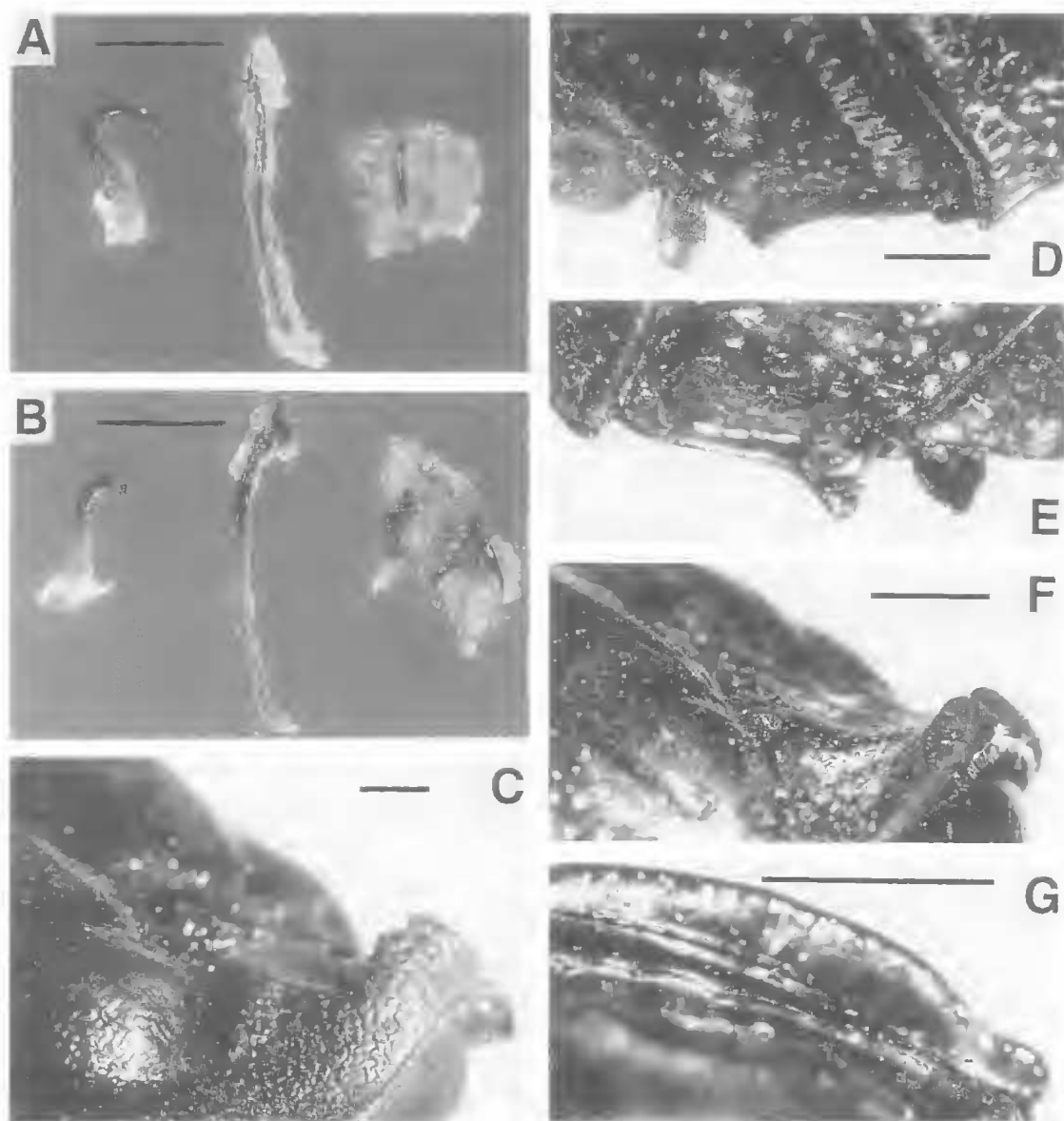


FIG. 9. A,E-G, *Macropanesthia saxicola* sp. nov., holotype ♂; B-D, *Macropanesthia rothi* sp. nov., holotype ♂. A,B, genitalia, R2-L2vm-L1; C,F, pronotum, lateral view; D,E, latero-caudal angles of T6 and supraanal plate, lateral margin of T7, dorsal view.

PARATYPES: 1 ♂, 1 ♀, same data as holotype, ANIC; 1 ♂, same data as holotype, QM; 1 ♀, Pikedale nr Texas, in grass beside road, 20.x.1990, G. Grigg, QM. OTHER MATERIAL: Queensland: 3 ♀, 3 ♂ nymphs, 2 ♀ nymphs, same data as holotype, USIC.

DESCRIPTION

Male

Colour. Head black; pronotum black, dark

brown to black laterally and posteriorly; meso- and metanotum black laterally, dark brown medially; legs black, meso- and metafemur brown posteroventrally; T1-7 dark brown to black tending darker from T1-7; supraanal plate dark brown to black; S2-6 black laterally, S3-6 brown medially; S7 black laterally, dark brown to black posteriorly, brown to black anteromedially; subgenital plate dark brown to

black; cerci black, usually ferruginous on apical tip; dorsal and ventral surfaces shiny.

Measurements. Total length 38.5 (38.2–40.6), pronotal length x width 10.3 x 15.3 (10.3–10.5 x 16.0–16.4).

Head. Hidden under pronotum, finely and sparsely punctate, slightly depressed above clypeus.

Thorax. Pronotum convex, subsemicircular, finely punctate, anterior margin indented medially and thickened producing a pair of weak broadly rounded tubercles (Fig. 9F); disc depressed posterior to tubercles and 2–3mm anterior of slightly thickened posterior margin, floor of depression roughened and finely punctate, with a pair of oblique anterior grooves meeting centrally in disc depression, meso- and metanotum finely punctate; anteroventral margin of front femur with 2–3 (rarely 4) large spines basally and very small almost obsolete spine distally, posterior margin with a large distal spine.

Abdomen. T2–6 weakly punctate to punctate laterally, very finely punctate medially; posterior margin of T6 thickened laterally producing a very broadly rounded ridge continuing to lateral margin (Fig. 9G), laterocaudal angle slightly produced into a very small caudally directed spine (Fig. 9E); T7 punctate, laterocaudal angle produced into an acute oblique spine directed ventrocaudally (Fig. 9E); supraanal plate punctate, anteromedial margin smooth, laterocaudal angle slightly produced forming a broadly rounded obtuse spine directed caudally, posterior margin weakly crenulate; S2–6 punctate laterally, S3–6 sparsely and finely punctate posteriorly and anteromedially, broadly rounded and concavely truncated posteriorly exposing subgenital plate; subgenital plate finely punctate; cerci bulbous and densely setaceous ventrally except on apical tip, dorsal surface non-setose and with a medial ridge basally, posterior margin concave (Fig. 9E); genitalia well developed, L2d absent, L2vm and L1 present, R2 developed into a strong sclerotised hook (Fig. 9A).

Female

Differs from male as follows: pronotum with weaker premarginal tubercles, disc less depressed; S7 broadly rounded but not concavely truncated posteriorly; subgenital plate absent; slightly larger than male.

Measurements. Total length 41.3–42.4, pronotal length x width 10.0–10.5 x 15.5–16.5.

Nymph

Similar to adults but without adult pronotal characters.

DISTRIBUTION AND BIOLOGY

Known only from the type locality in fairly heavy loam with *Eucalyptus* and *Callitris* forest; not abundant. The soil is usually hard and the burrows shallow.

REMARKS

Shaped like *P. gigantea* it is darker and lacks the row of spines on the sixth tergite.

ETYMOLOGY

Latin *saxum*, rock and *-cola*, dweller.

Neogeoscapheus barbarae sp. nov. (Fig. 11)

MATERIAL EXAMINED

HOLOTYPE: ♂ 1km S of Brighooda, 26°15'S 151°25'E, dug up, 25.i.1992, HAR, QM.

PARATYPES: 1 ♂, 1 ♀, 'Marshlands' 12km N of Hivesville, dug up, 25.ii.1988, HAR, DR, JRW, ANIC; 1 ♂, 1 ♀ same data as holotype, QM; 1 ♂, 'Marshlands' 12km N of Hivesville, dug up, 25.ii.1988, HAR, DR, JRW, QM.

OTHER MATERIAL. Queensland: 13 ♀, 10 ♀, 3 ♂ nymphs, 3 ♀ nymphs, same data as 'Marshlands' paratypes, USIC; 1 ♂, 2 ♀, 2 ♂ nymphs, 3 ♀ nymphs, same data as holotype, USIC.

DESCRIPTION

Male

Colour. Head and thorax very dark brown to black; pro-, meso- and metanotum slightly ferruginous posteriorly; tuberculate areas of pronotum black; legs black, tarsi and ventral surface of meso- and metafemurs ferruginous; tergites black; S1–6 shiny black laterally, ferruginous medially; S7 black, ferruginous anteromedially; subgenital plate black, posterior margin often ferruginous; cerci dark brown, light brown apically; dorsal and ventral surfaces shiny.

Measurements. Total length 44.6 (42.7–53.6), pronotal length x width 12.2 x 19.5 (11.7–15.3 x 17.3–22.2).

Head. Punctate, hidden under pronotum, frons slightly depressed between antennal sockets.

Thorax. Pronotum convex, subsemicircular, anterior margin slightly indented medially, with a medial premarginal thickening forming a pair of broad transverse tubercles which are slightly

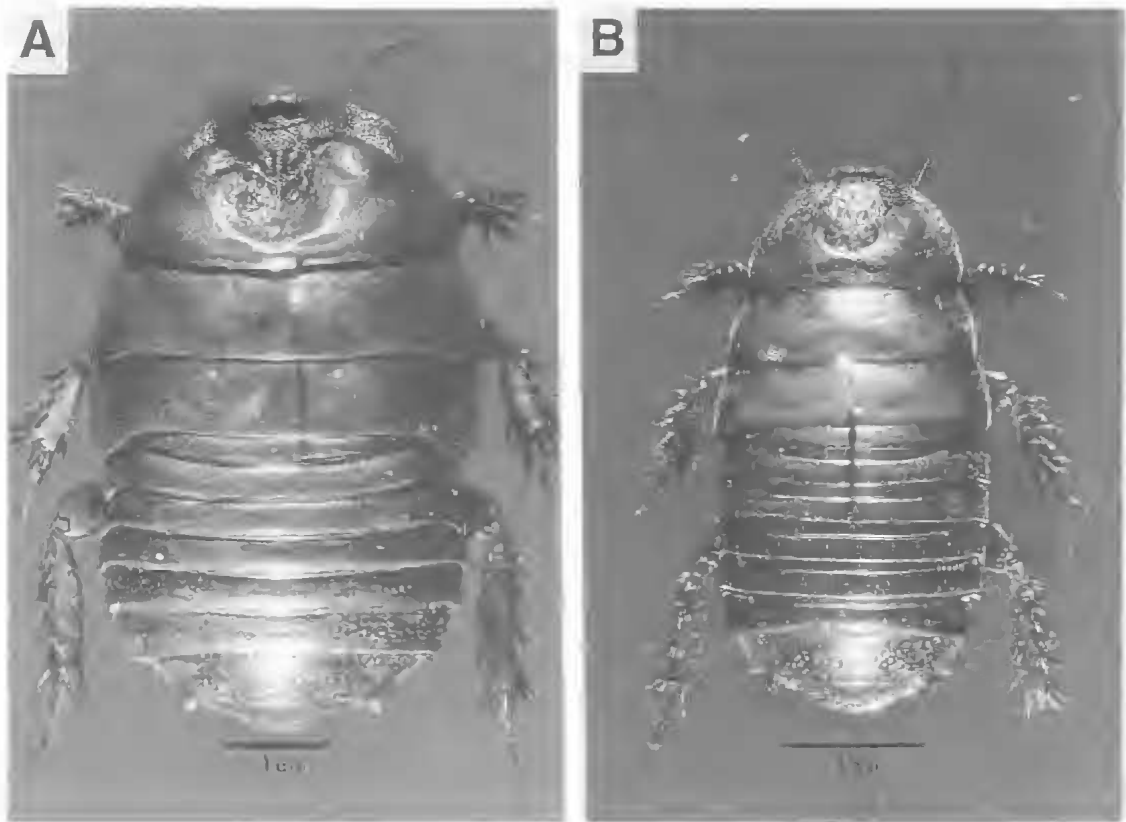


FIG. 10. A, *Macropanesthia rothi* sp. nov., holotype ♂; B, *Macropanesthia saxicola* sp. nov., holotype ♂. A,B, habitus, dorsal view.

recurved (Fig. 11D); disc depressed posterior to tubercles to 2–3mm from posterior margin, floor of depression transversely striate behind anterior tubercles and anterior to a pair of oblique anterior grooves, a pair of feeble separated disc tubercles present posterior to oblique grooves, remainder of pronotum punctate, punctations slightly stronger and denser anterolaterally; meso- and metanotum finely and sparsely punctate; anteroventral margin of front femur with 2–3 (rarely 4) large spines basally and small distal spine, posterior margin with a large distal spine.

Abdomen. Tergites weakly punctate, punctations denser laterally; laterocaudal angle of T6 not produced, posterior margin with a large acute spine 3mm from the lateral margin (Fig. 11E), spine often blunt; T7 punctate, punctations larger and denser medially, laterocaudal angle produced into a spine directed laterally and slightly reflexed dorsally (Fig. 11C); supraanal plate punctate, laterocaudal angles produced obtusely, posterior margin smooth and slightly upturned; sternites punctate, punctations weak

anteromedially, stronger and denser laterally; S7 broadly rounded, with a shallow concave truncation exposing subgenital plate; subgenital plate weakly punctate posteriorly; cerci bulbous tapering to an acute rounded tip, proximal half with a dorsal medial ridge, densely setaceous ventrally except along apical margins, dorsal surface non-setose; genitalia well developed, L2d absent, L2vii and L1 present, R2 developed into a strong sclerotised hook (Fig. 11B).

Female

Differs from male as follows: pronotum with premarginal thickening greatly reduced, tubercles absent, disc slightly depressed in anterior half only; subgenital plate absent; sternite 7 broadly rounded but not concavely truncated posteriorly.

Measurements. Total length 40.7–51.7, pronotal length x width 11.0–12.9 x 17.5–19.9.

Nymph

Similar to adults but without adult pronotal

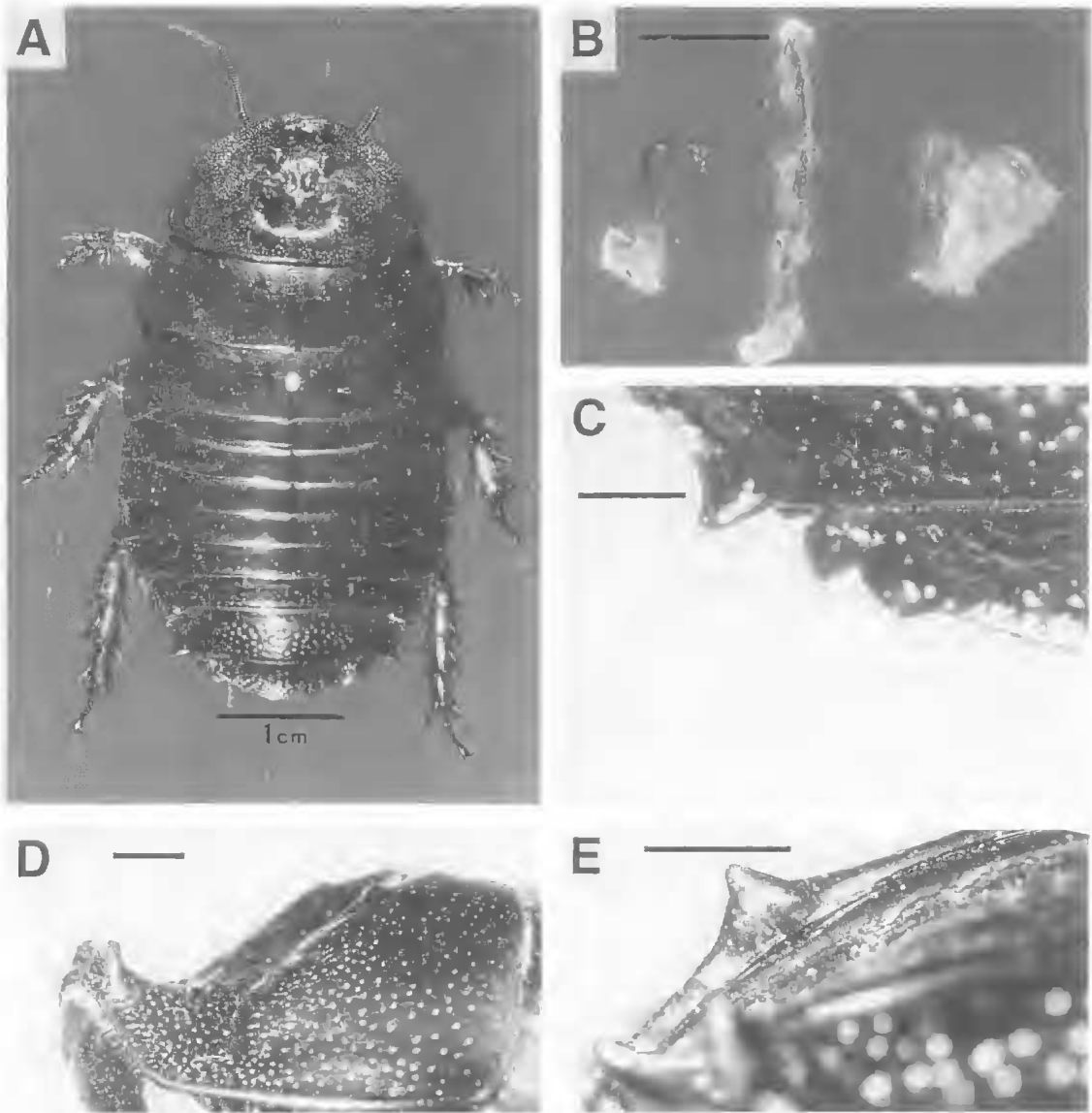


FIG. 11. *Neogeoscapheus barbarae* sp. nov., holotype ♂. A, habitus, dorsal view; B, genitalia, K2-L2vm-L1; C, lateral margins of T7 and supraanal plate, dorsal view; D, pronotum, lateral view; E, lateral portion of posterior margin of T6, posterior view.

characters (anterior tubercles and depressed disc).

DISTRIBUTION AND BIOLOGY

Two populations of this species are known from SE Queensland. The type locality near Brigooda is in softwood scrub with scattered evergreen vine thickets on a brown to red loam. The 'Marshlands' population lives in a similar habitat.

REMARKS

Similar to *N. hirsutus* (Shaw) but distinguished by a well produced spine on the posterior margin of T6, rather than a rounded tubercle. It is also darker in colour than *N. hirsutus*.

ETYMOLOGY

For Barbara Rose, wife of H. A. Rose, and who has been involved with research into soil burrowing cockroaches since 1975.

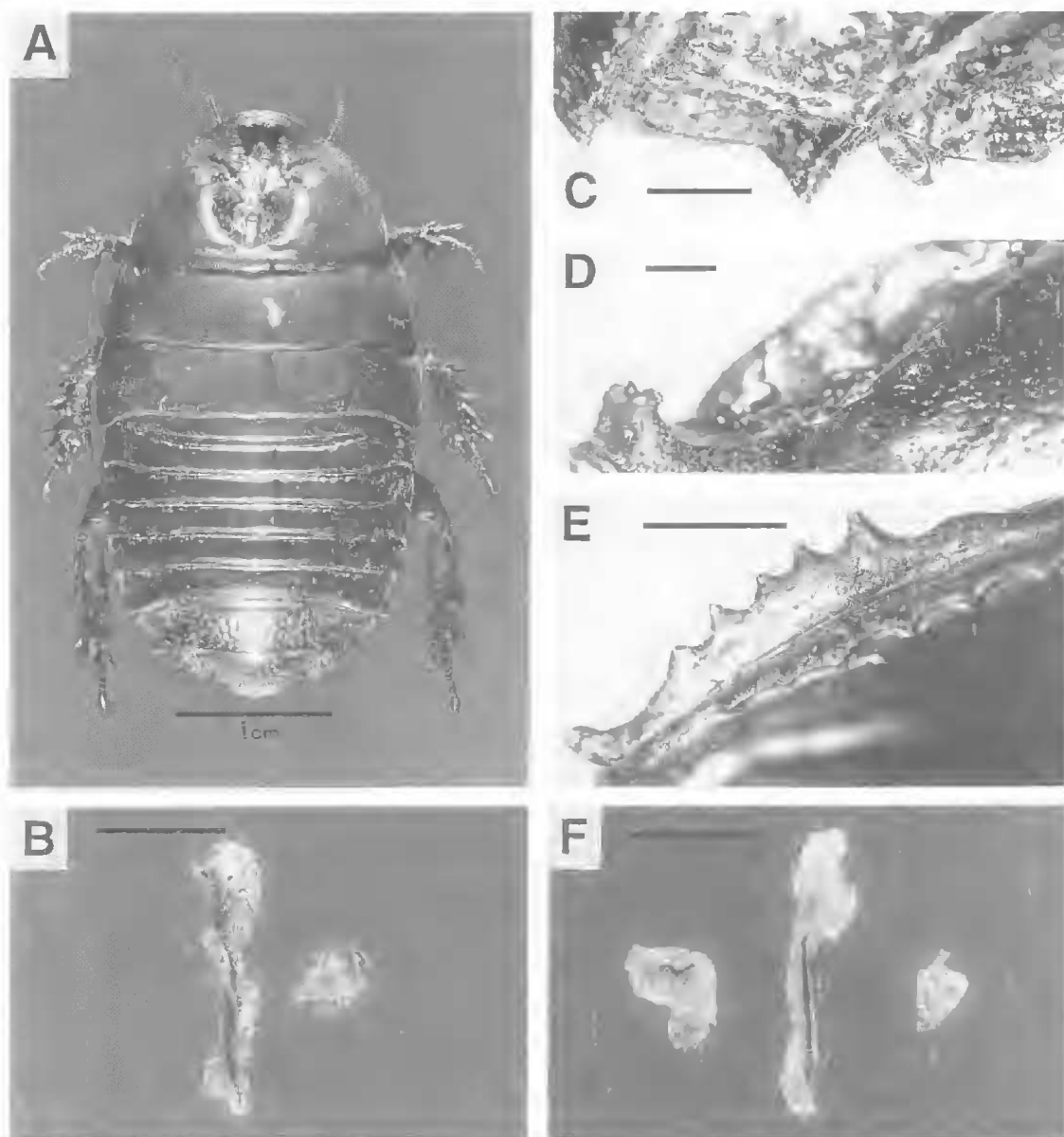


FIG. 12. *Parapanesthia pearsoni* sp. nov. A-E, holotype ♂; F, paratype ♂. A, habitus, dorsal view; B, genitalia, L2vm-L1; C, laterocaudal angle of T6, lateral margins of T7 and supraanal plate; D, pronotum, lateral view; E, lateral portion of posterior margin of T6, posterior view; F, genitalia, L1-L2vm-R2.

***Parapanesthia pearsoni* sp. nov.**
(Fig. 12)

MATERIAL EXAMINED

HOLOTYPE. ♂, Blackdown Tableland, Dawson Range, 23°49'S 149°06'E, dug up, 15.xii.1986, HAR, DR, JRW, QM.

PARATYPES: 1 ♂, 1 ♀, Blackdown Tableland, Dawson Range, 23°49'S 149°06'E, dug up, iv.1988, HAR, ANIC; 1 ♂, 1 ♀, Blackdown Tableland, Dawson

Range, 23°49'S 149°06'E, dug up, 26.iv.1992, BRR, HAR, JAW, JRW, QM.

OTHER MATERIAL: 1 ♀, 1 ♀ nymph, Blackdown Tblld. Oct. 1985, S. C. Pearson, QM; 2 ♂, 3 ♀, 1 ♂ nymph, Blackdown Tableland, Dawson Range, 23°49'S 149°06'E, dug up, iv.1988, HAR, USIC; 2 ♂, 2 ♀, 1 ♂ nymph, 4 ♀ nymphs, data as for holotype, USIC; 3 ♂, 2 ♀, 8 ♂ nymphs, 9 ♀ nymphs, Blackdown Tableland, Dawson Range, 23°49'S 149°06'E, dug up, 26.vi.1992, BRR, HAR, JAW, JRW, USIC.

DESCRIPTION

Male

Colour. Head black, clypeus brown; pronotum black, ferruginous laterally; meso- and metanotum ferruginous to black; legs very dark brown to black, spines black apically, posteroventral surface of meso- and metafemur ferruginous to tan; T1-6 very dark brown to black; T7 and supraanal plate black; S1-6 black, ferruginous anteromedially, subgenital plate black; cerci dark brown to black; dorsal and ventral surfaces shiny.

Measurements. Total length 54.4 (51.4-52.4), pronotal length x width 16.7 x 24.4 (15.2-15.9 x 23.0-23.8).

Head. Punctate, hidden under pronotum, frons weakly striate transversely and slightly depressed between antennal sockets.

Thorax. Pronotum convex, subsemicircular, anterior margin with a medial premarginal thickening forming a pair of broad transverse tubercles which are slightly recurved (Fig. 12D), anterior margin may be feebly indented medially; disc depressed posterior to tubercles to 2-3mm from the medially thickened posterior margin, floor of depression transversely striate behind anterior tubercles and anterior to a pair of oblique grooves, pronotum with fine sparse punctations; meso- and metanotum finely and sparsely punctate; anteroventral margin of front femur with 3-4 (rarely 2) large spines basally and a small distal spine, posterior margin with a large distal spine.

Abdomen. Tergites punctate, punctations stronger and denser laterally; laterocaudal angle of T6 produced laterally into an acute oblique spine, slightly reflexed dorsally; posterior margin of T6 with 4-6 (rarely 3 or 7) irregular erect teeth laterally (Fig. 12E); T7 strongly punctate, laterocaudal angle produced into a short slightly upturned oblique spine (Fig. 12C), posterior margin may or may not possess 2 or 3 small teeth laterally in a similar position to those on T6; supraanal plate strongly and densely punctate, laterocaudal angles slightly produced obtusely, posterior margin smooth or weakly undulate and slightly upturned; S1-6 weakly punctate medially, punctations stronger and denser laterally; S7 broadly triangular, concavely truncated posteriorly exposing subgenital plate; cerci bulbous, tapering to a broadly rounded tip, proximal half with a dorsal medial ridge, setaceous ventrally except apically and on anterior margin, dorsal surface nonsetose; genitalia slightly reduced, L2d absent, L2vm present, L1 weak, R2 reduced to a

mound (Fig. 12B,F).

Female

Differs from male as follows: pronotum with premarginal thickening reduced, tubercles almost obsolete, disc depressed for anterior half only, posterior margin hardly thickened; subgenital plate absent; S7 not concavely truncated posteriorly.

Measurements. Total length 46.2-51.4, pronotal length x width 12.4-13.4 x 20.2-20.6.

Nymph

Similar to adults but without adult pronotal characters (anterior tubercles and depressed disc). Tubercles on posterior margin of T6 less produced than in adults.

DISTRIBUTION AND BIOLOGY

Known only from type locality in *Eucalyptus* forest on a fine grey to black loam.

REMARKS

The holotype has the R2 genital phallomere missing (Fig. 12B). Desiccation and hardening of the specimen made dissection of genitalia difficult. It is likely that the R2 phallomere was lost during dissection as all other male specimens examined possessed this sclerite. *P. gigantea* is much smaller than this species and not as dark.

ETYMOLOGY

For Steve Pearson, a ranger at Blackdown Tableland National Park, who discovered the species.

DISCUSSION

Geoscapheinae are concentrated in SE Queensland (10 of 19 species are found only in SEQ). Some live within a few km of each other but are not sympatric. Populations of *G. dilatatus* and *G. robustus* from some semi-arid regions of Queensland, New South Wales and South Australia are known to be sympatric. *M. kraussiana* and *G. dilatatus* also occur in sympatry near Cobar and south of Broken Hill.

Generic assignment was difficult in some cases. *P. pearsoni* sp. nov. and *N. barbarae* sp. nov., for example, fit into existing genera easily but others have features of more than one genus. This is also reflected by the wide differences in male genitalia, in contrast to the rest of the Blaberidae. Genitalia are generally considered to be conservative with respect to evolution and show little diversification (McKittrick, 1964).

However, the Geoscapheinae are a clearly defined group, all being similar in gross morphology, ecology and behaviour. Perhaps genera may not reflect phylogeny? Further studies of inter-generic relationships are needed.

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